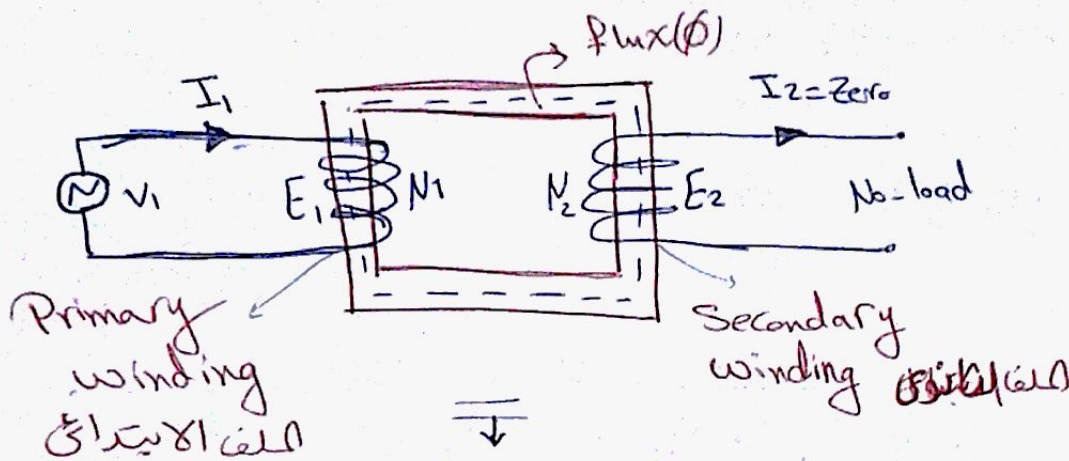


Lec 7: Performance c/s of efficiency (2%)
of 1- ϕ transformer

Outline:

- ① Transformer under no loading
- ② Transformer under loading
- ③ Equivalent circuit of 1- ϕ transformer
- ④ Losses & efficiency of 1- ϕ transformer

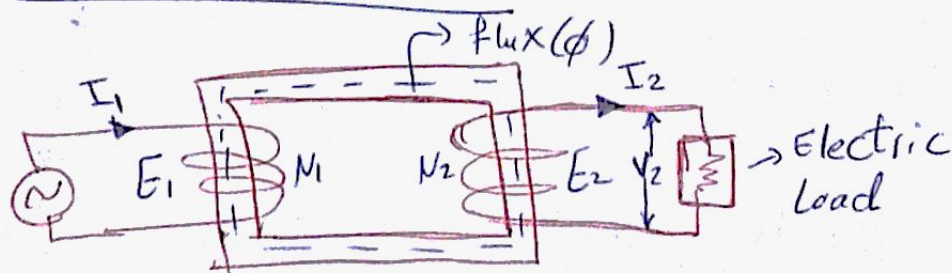


"No loading transformer"

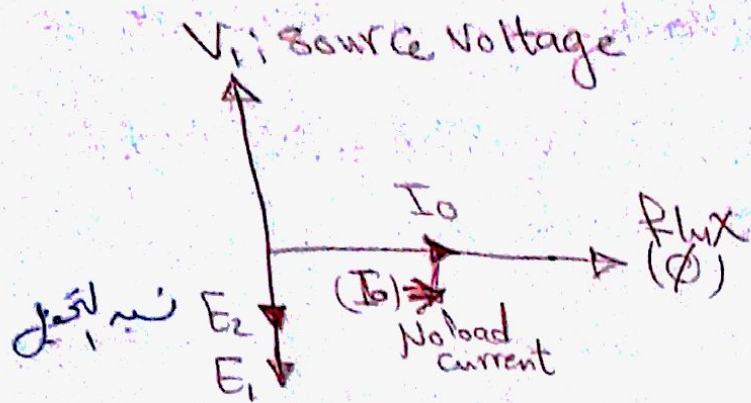
V_1 : Alternating Voltage Source (AC)

E_1 & E_2 : induced voltage on Primary winding & Secondary winding
ولت الپریماری، ولت الیسکونڈری

$I_1 < I_2$



"loading transformer"



turns ratio $\frac{N_2}{N_1} = \frac{1}{2}$

losses in transformers

- Electrical losses
- Magnetic losses
- * No mechanical losses

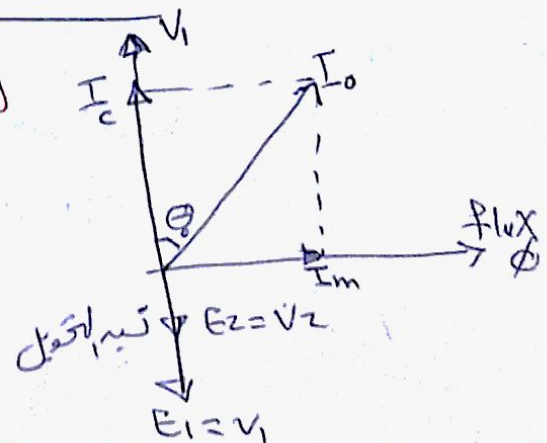
*** Ideal transformer: has no losses

* Iron losses = $V_1 I_0 \cos \theta_0$ (Watt)

* $I_c = I_0 \cos \theta_0$ [Amp]

* $I_m = I_0 \sin \theta_0$ [Amp]

* $I_0 = \sqrt{I_m^2 + I_c^2}$ [Amp]



Practical transformer

I_c : Core loss current

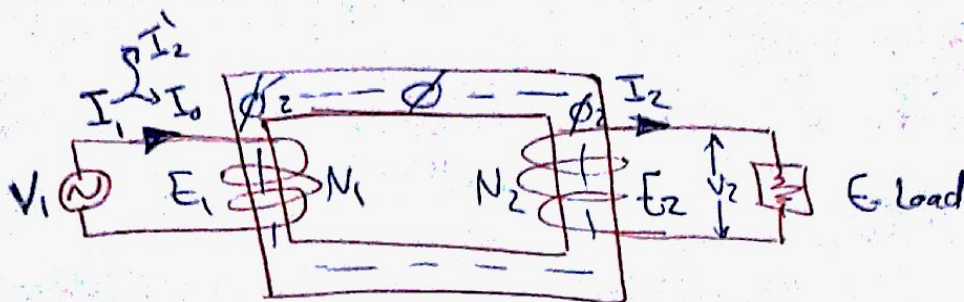
I_m : magnetizing current

(Produce mutual flux in magnetic core)

the hysteresis & eddy current losses

سبب الفقد في القلب

"Transformer under loading condition"



في حالة التحميل Φ_1, Φ_2 *

